p1020: graded take-home open-note practice exam (version 208)

Question 1

Let f represent a function. If $f[36] = 11$, then there exists a knowable solution to the equation below.

$$y = 7 \cdot (f[2x + 24] - 9)$$
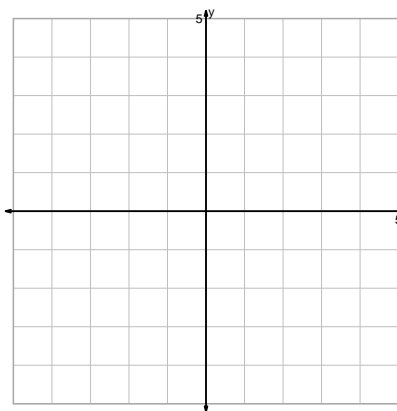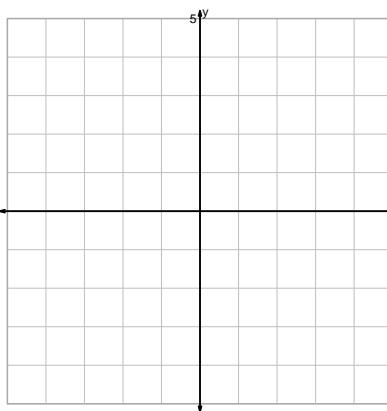
Find the solution.

$x =$

$y =$

Question 2

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.
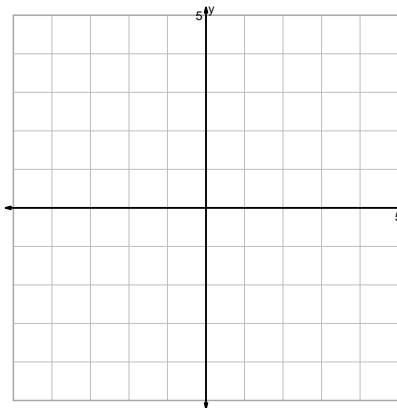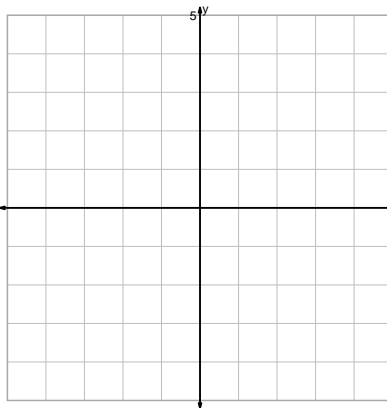
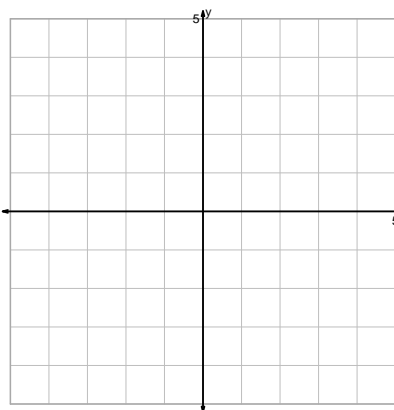$y = \sqrt[3]{2x}$

$y = (x + 2)^3$

$y = \sqrt{x - 2}$

$y = 2^{\frac{x}{2}}$
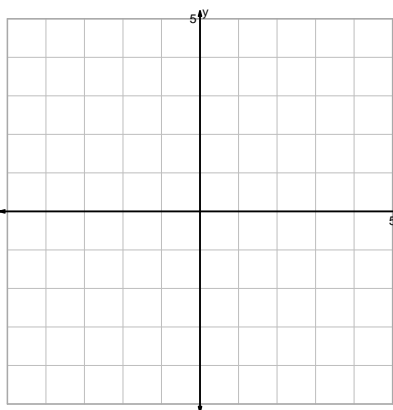
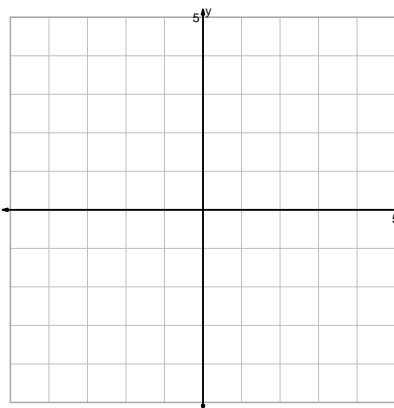$$y = -\log_2\!\left(x\right)$$

$$y = 2 \cdot x^2$$

$$y = x^3 + 2$$
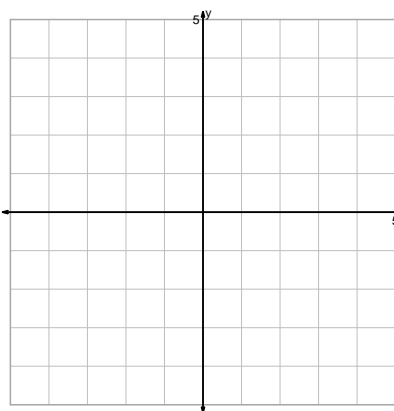
$$y = \log_2\!\left(x\right) - 2$$
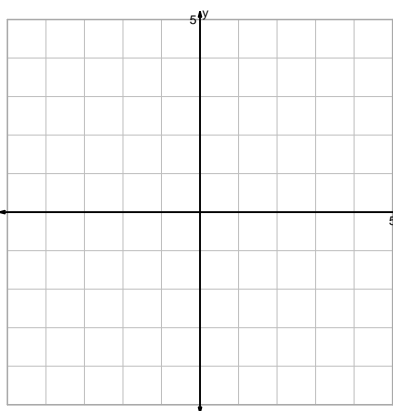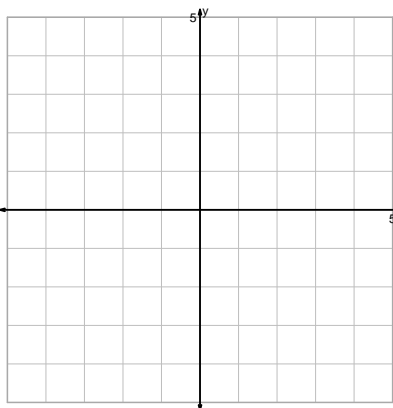
$$y = \dfrac{x^2}{2}$$

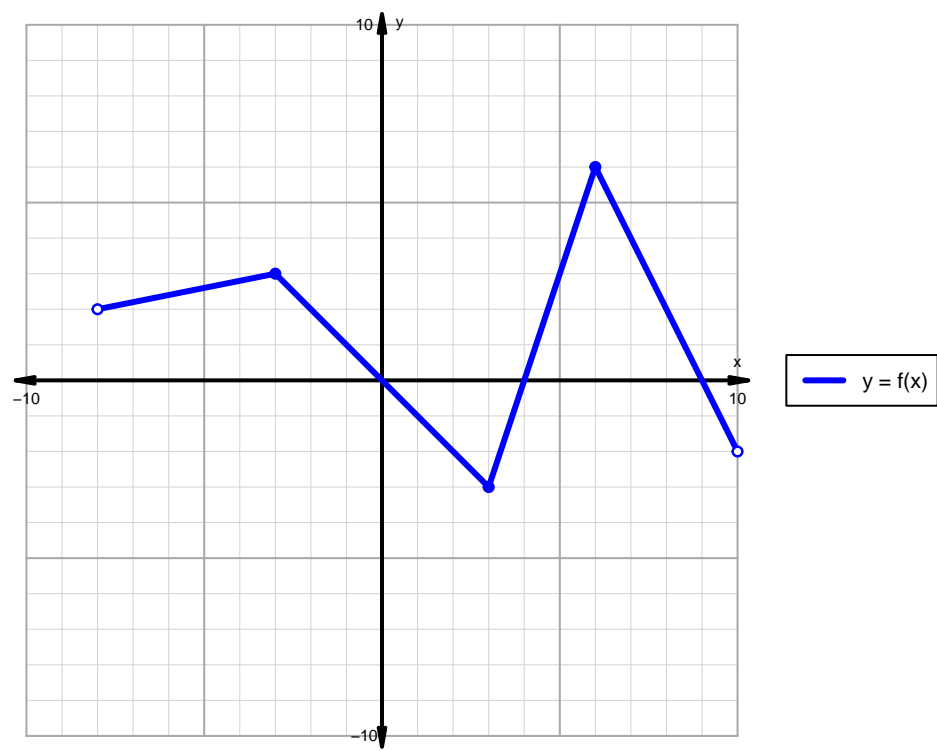$$y = \sqrt{-x}$$

Question 3

A function is graphed below.

Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4

Let f represent a function. The curves $b = f[a]$ and $y = 4 \cdot \left(f\left[\frac{x-2}{5}\right] - 6\right)$ are represented below in a table and on graphs.

a	b	x	y
-9	-12	-43	-72
-3	3	-13	-12
-2	22	-8	64
12	11	62	20

$b = f[a]$

$y = 4 \cdot \left(f\left[\frac{x-2}{5}\right] - 6\right)$
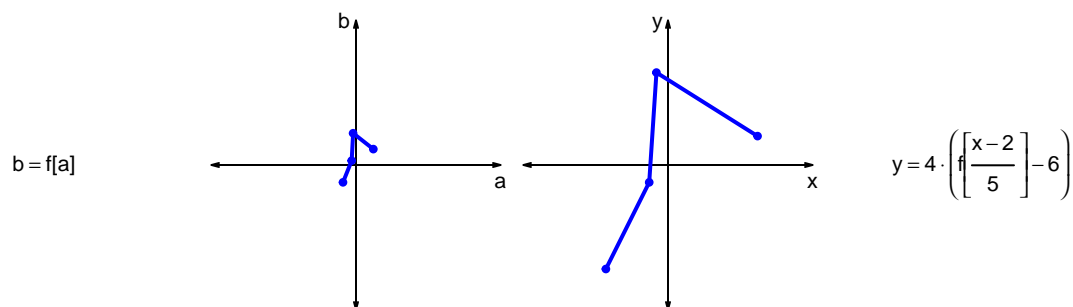
a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 4 \cdot \left(f\left[\frac{x-2}{5}\right] - 6\right)$?

4

Question 5

A parent square-root function is transformed in the following ways:
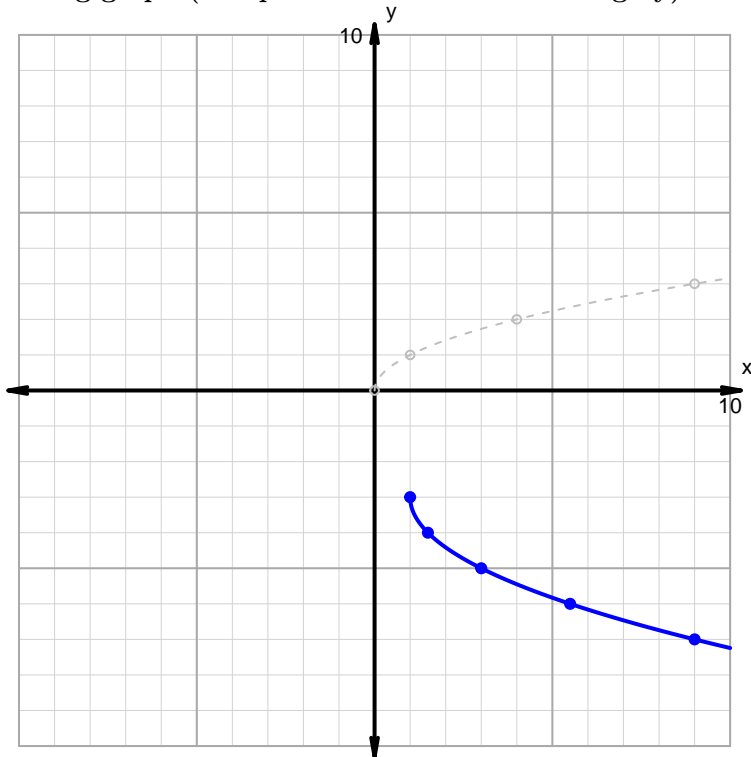
Horizontal transformations

1. Horizontal shrink by factor 2.
2. Translate right by distance 1.

Vertical transformations

1. Translate up by distance 3.
2. Vertical reflection over x axis.

Resulting graph (and parent function in dashed grey):

- What is the equation for the curve shown above?

Question 6

Make an accurate graph, and describe locations of features.

$$y \;=\; \frac{1}{3} \cdot |x + 4| - 1$$

Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	